CLAIMS

What is claimed is:

1. A polymeric metal complex composition comprising (a) a conjugated polymeric backbone; (b) a plurality of a first-type functional groups; and (c) a plurality of first-type inert spacer groups, wherein:

each of the plurality of first-type functional groups is covalently bound to at least one of the plurality of first-type inert spacer groups, which first-type inert spacer groups are covalently bound to the polymeric backbone; and

at least a portion of each of the plurality of first-type functional groups is coordinated to at least one metal.

2. The composition of Claim 1, further comprising (d) a plurality of second-type functional groups.

3. The composition of Claim 2, wherein at least one of the plurality of second-type functional groups is covalent bound to at least one of a plurality of second-type inert spacer groups, which second-type inert spacer groups are covalently bound to the polymeric backbone.

4. The composition of Claim 3, wherein at least one of the plurality of the first-type inert spacer groups is the same composition as at least one of the plurality of the second-type inert spacer groups.

5. The composition of Claim 4, wherein at least one of the plurality of first-type functional groups is covalently bound to an inert spacer group that is also covalently bound to at least one of the second-type functional groups.

6. The composition of Claim 1, wherein the ratio of the number of first-type inert spacer groups to the number of first-type functional groups is 1:1.

7. The composition of Claim 3, wherein the ratio of the number of second-type inert spacer groups to the number of second-type functional groups is 1:1.

8. The composition of Claim 1, wherein the conjugated polymeric backbone has at least one recurring monomeric unit selected from fluorenediyls, phenylenes, phenylenevinylenes, oxadiazolediyls, thiophenediyls, and arylaminediyls.

9. The composition of Claim 1, wherein the conjugated polymeric backbone has a non-conjugated segment comprising recurring monomeric units selected from vinyl carbazolediyls and triarylmethanediyls.

10. The composition of Claim 1, wherein at least one of the

plurality of first-type inert spacer groups is an alkyl chain of from 1 to 12 carbon atoms.

11. The composition of Claim 3, wherein at least one of the plurality of second-type inert spacer groups is an alkyl chain of from 1 to 12 carbon atoms.

12. The composition of Claim 1, wherein at least one of the plurality of first type functional groups is selected from β-dicarbonyls, phosphinoalkanols, aminocarboxylic acids, iminocarboxylicacids, salycylic acids, and hydroxyquinolines.

13. The composition of Claim 1, wherein at least one of the metal is selected from iridium, platinum, rhenium and ruthenium.

14. The composition of Claim 13, wherein at least one of the metal is further coordinated to at least one ligand selected from 2-arylpyridines, 2-arylpyrimidines and 2-arylquinolines, 2-thienylpyridines, 2-thienylquinolines, 2-thienyldiazines, 2-pyrrolylpyridines, 2-pyrrolylquinolines, and 2-pyrrolyldiazines.

15. An luminescent material comprising at least one polymeric metal complex composition comprising (a) a conjugated polymeric backbone; (b) a plurality of a first-type functional groups; and (c) a plurality of first-type inert spacer groups, wherein:

each of the plurality of first-type functional groups is covalently bound to at least one of the plurality of first-type inert spacer groups, which first-type inert spacer group is covalently bound to the polymeric backbone, and

at least a portion of each of the plurality of first-type functional groups are coordinated to at least one metal.

16. The luminescent material of Claim 15, wherein the at least one polymeric metal complex composition further comprises (d) a plurality of second-type functional groups.

17. The luminescent material of Claim 16, wherein at least one of the plurality of second-type functional groups is covalent bound to at least one of a plurality of second-type inert spacer groups, which second-type inert spacer groups are covalently bound to the polymeric backbone.

18. The luminescent material of Claim 17, wherein at least one of the plurality of the first-type inert spacer groups is the same composition as at least one of the plurality of the second-type inert spacer groups.

19. The luminescent material of Claim 17, wherein at least one of the first-type functional groups is covalently bound to an inert spacer group

that is also covalently bound to at least one of the second-type functional groups.

20. The luminescent material of Claim 15, wherein the ratio of the number plurality of first-type inert spacer groups to the number of the plurality of first-type functional groups is 1:1.

21. The luminescent material of Claim 17, wherein the ratio of the number plurality of second-type inert spacer groups to the number of plurality of second-type functional groups is 1:1.

22. The luminescent material of Claim 15 wherein the conjugated polymeric backbone has at least one recurring monomeric unit selected from fluorenediyls, phenylenes, phenylenevinylenes, oxadiazolediyls, and thiophenediyls.

23. The luminescent material of Claim 15 wherein at least one of the plurality of first-type inert spacer groups is an alkyl chain of from 1 to 12 carbon atoms.

24. The luminescent material of Claim 17 wherein at least one of the plurality of second-type inert spacer groups is an alkyl chain of from 1 to 12 carbon atoms.

25. The luminescent material of Claim 15 wherein at least one of the first type functional groups is selected from β-dicarbonyls, phosphinoalkanols, aminocarboxylic acids, iminocarboxylicacids, salycylic acids, and hydroxyquinolines.

26. The luminescent material of Claim 15 wherein at least one of the metal is selected from iridium, platinum, rhenium, and ruthenium.

27. The luminescent material of Claim 26 wherein at least one of the metal is further coordinated to at least one ligand selected from 2-arylpyridines, 2-arylpyrimidines and 2-arylquinolines, 2-thienylpyridines, 2-thienylquinolines, 2-thienyldiazines, 2-pyrrolylpyridines, 2-pyrrolylquinolines, and 2-pyrrolyldiazines.

28. The luminescent material of Claim 15 wherein the conjugated polymeric backbone has at least one fluorenediyl recurring monomeric unit, the first type functional group is a β-dicarbonyl, and the metal is iridium.

29. An organic electronic device comprising at least one polymeric metal complex composition comprising (a) a conjugated polymeric backbone; (b) a plurality of a first-type functional groups; and (c) a plurality of first-type inert spacer groups, wherein:

each of the plurality of first-type functional groups is covalently

bound to at least one of the plurality of first-type inert spacer groups, which first-type inert spacer group is covalently bound to the polymeric backbone, and

at least a portion of each of the plurality of first-type functional groups is coordinated to at least one metal.

30. The device of Claim 29, wherein the at least one polymeric metal complex composition further comprises (d) a plurality of second-type functional groups.

31. The device of Claim 30, wherein at least one of the plurality of second-type functional groups is covalent bound to at least one of a plurality of second-type inert spacer groups, which second-type inert spacer groups are covalently bound to the polymeric backbone.

32. The device of Claim 31, wherein at least one of the plurality of the first-type inert spacer groups is the same composition as at least one of the plurality of the second-type inert spacer groups.

33. The device of Claim 32, wherein at least one of the first-type functional groups is covalently bound to an inert spacer group that is also covalently bound to at least one of the second-type functional groups.

34. The device of Claim 29, wherein the ratio of the number of plurality of first-type inert spacer groups to the number of plurality of first-type functional groups is 1:1.

35. The device of Claim 31, wherein the ratio of the number of plurality of second-type inert spacer groups is covalently bound to the number of plurality of second-type functional groups is 1:1.

36. The device of Claim 29 wherein the conjugated polymeric backbone has at least one recurring monomeric unit selected from fluorenediyls, phenylenes, phenylenevinylenes, oxadiazolediyls, and thiophenediyls.

37. The device of Claim 30 wherein at least one of the plurality of first-type inert spacer groups is an alkyl chain of from 1 to 12 carbon atoms.

38. The device of Claim 31 wherein at least one of the plurality of second-type inert spacer groups is an alkyl chain of from 1 to 12 carbon atoms.

39. The device of Claim 29 wherein at least one of the first type functional groups is selected from β-dicarbonyls, phosphinoalkanols, aminocarboxylic acids, iminocarboxylicacids, salycylic acids, and hydroxyquinolines.

40. The device of Claim 29 wherein at least one of the metal is selected from iridium, platinum, rhenium, and ruthenium.

41. The device of Claim 40 wherein at least one of the metal is further coordinated to at least one ligand selected from 2-arylpyridines, 2-arylpyrimidines and 2-arylquinolines, 2-thienylpyridines, 2-thienylquinolines, 2-thienyldiazines, 2-pyrrolylpyridines, 2-pyrrolylquinolines, and 2-pyrrolyldiazines.